

CLAIMS

What is claimed is:

1. In a thermoplastic composition comprising a compounded blend of a polyester and a polycarbonate, the improvement comprising preparing the polyester in the presence of a titanium-containing catalyst compound in an amount of from about 1 to about 30 ppm elemental titanium and, optionally, a ester exchange catalyst in an amount of from about 1 to about 150 ppm of an active element utilized when an acid component of the polyester is derived from a diester of a dicarboxylic acid, with ppm based on the total weight of the polyester.
2. The thermoplastic composition of claim 1 wherein the titanium-containing catalyst compound is present in an amount of from about 1 to about 20 ppm elemental titanium.
3. The thermoplastic composition of claim 1 wherein the titanium-containing catalyst compound is present in an amount of from about 1 to about 15 ppm elemental titanium.
4. The thermoplastic composition of claim 1 wherein the compounded blend further comprises a post-polycondensation phosphorus-containing compound in an amount of from about 0.01 to about 500 ppm elemental phosphorus, with ppm based on the total weight of the compounded blend.
5. The thermoplastic composition of claim 4 wherein the phosphorus-containing compound is added after polycondensation in the preparation of the polyester and is present in an amount of from about 10 to about 350 ppm.

6. The thermoplastic composition of claim 5 wherein the phosphorus-containing compound is present in an amount of from about 50 to about 150 ppm.

5 7. The thermoplastic composition of claim 1 wherein the compounded blend further comprises a phosphorus-containing compound present in an amount of from about 10 to about 100 ppm, based on the weight of the polyester, and added during the preparation of the polyester prior to polycondensation.

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8. In a thermoplastic composition comprising a polymer mixture of from about 1 to about 99 weight percent of a polyester and from about 99 to about 1 weight percent of a polycarbonate, the improvement comprising the polyester comprising residues of (i) a titanium-containing catalyst
15 compound in an amount of from about 1 to about 30 ppm elemental titanium, (ii) a pre-polycondensation phosphorus-containing compound in an amount of from about 1 to about 150 ppm elemental phosphorus and (iii) optionally, an ester exchange catalyst in an amount of from about 1 to about 150 ppm of an active element utilized when the acid component is
20 derived from a diester of the dicarboxylic acid, with ppm based on the total weight of the polyester.

9. The thermoplastic composition of claim 8 wherein the titanium-containing catalyst compound is present in an amount of from about 1 to
25 about 20 ppm elemental titanium.

10. The thermoplastic composition of claim 8 wherein the titanium-containing catalyst compound is present in an amount of from about 1 to about 15 ppm elemental titanium.

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11. The thermoplastic composition of claim 8 wherein the polyester further comprises residues of about 1 to about 10 ppm of at least one copolymerizable compound of a 6-aryl amino-1-cyano-3H-dibenz[f,ij]isoquinoline-2,7-dione or a 1,4-bis(2,6-dialkylanilino) anthraquinone in combination with at least one bis anthraquinone or bis anthrapyridone(6-aryl amino-3H-dibenz[f,ij]isquinoline-2,7-done) compound, wherein the compounds contain at least one polyester reactive group.
12. The thermoplastic composition of claim 8 wherein the polymer mixture further comprises about from 0.01 to about 0.35 weight percent of a post-polycondensation phosphorus-containing compound, based on the total weight of the polymer mixture.
13. The thermoplastic composition of claim 12 wherein the post-polycondensation phosphorus-containing compound is present in an amount of from about 0.05 to about 0.15 weight percent.
14. The thermoplastic composition of claim 12 wherein the post-polycondensation phosphorus-containing compound is distearyl pentaerythritol diphosphite.
15. The thermoplastic composition of claim 8 wherein the polymer mixture is a compounded blend.
16. A molded article formed from the thermoplastic composition of claim 8.
17. A film or sheet formed from the thermoplastic composition of claim 8.

18. The thermoplastic composition of claim 8 wherein the polyester comprises (a) an acid component comprising repeat units from at least one aromatic, aliphatic, or alicyclic dicarboxylic acid, wherein the aromatic portion of said aromatic dicarboxylic acid has 6-20 carbon atoms and
5 wherein the aliphatic or alicyclic portion of said aliphatic or alicyclic dicarboxylic acid has 3-20 carbon atoms, and b) a diol component comprising repeat units from at least one aliphatic, aliphatic ether, or cycloaliphatic diol having 2-20 carbon atoms.
- 10 19. The thermoplastic composition of claim 18 wherein the acid component comprises repeat units from about 80 to 100 mole percent terephthalic acid, isophthalic acid, naphthalenedicarboxylic acid, 1,4-cyclohexanedicarboxylic acid or mixtures thereof and from 0 to about 20
15 mole percent of other dicarboxylic acid units having from about 4 to about 40 carbon atoms; and the diol component comprises repeat units from about 40 to 100 mole percent 1,4-cyclohexanedimethanol, from 0 to about 60 mole percent ethylene glycol, and from 0 to about 20 mole percent of other diol units having from 3 to about 12 carbon atoms; wherein the total mole percent of the acid component is equal to 100 mole percent and the total
20 mole percent of the diol component is equal to 100 mole percent.
20. The thermoplastic composition of claim 19 wherein the polyester comprises from about 95 to 100 mole percent of terephthalic acid, from about 58 to about 66 mole percent 1,4-cyclohexanedimethanol and from
25 about 42 to about 34 mole percent of ethylene glycol.
21. The thermoplastic composition of claim 19 wherein the polyester comprises 100 mole percent 1,4-cyclohexanedimethanol, from about 22 to about 30 mole percent isophthalic acid, and from about 78 to about 70 mole
30 percent terephthalic acid.

22. In a thermoplastic composition comprising a miscible blend of:
- (a) about 1 to about 99 weight percent of a polyester comprising:
- 5 (i) an acid component comprising repeat units from about 80 to 100 mole percent terephthalic acid, isophthalic acid, naphthalenedicarboxylic acid, 1,4-cyclohexanedicarboxylic acid or mixtures thereof and from 0 to about 20 mole percent of other dicarboxylic acid units having from about 4 to about 40 carbon atoms, wherein the total mole percent of the acid component is equal to 100 mole percent,
- 10 and
- (ii) a diol component comprising repeat units from about 40 to 100 mole percent 1,4-cyclohexanedimethanol, from 0 to about 60 mole percent ethylene glycol, and from 0 to about 20 mole percent of other diol units having from 3 to about 12 carbon atoms, wherein the total mole percent of diol component is equal to 100 mole percent;
- 15 and
- (b) about 99 to about 1 weight percent of a polycarbonate of 4,4-isopropylidenediphenol;
- 20 the improvement comprising the polyester comprising catalyst residues of (i) a titanium-containing catalyst compound in an amount of from about 1 to about 20 ppm elemental titanium, (ii) a pre-polycondensation phosphorus-containing compound in an amount of from about 1 to about 150 ppm elemental phosphorus, (iii) from about 1 to about 10 ppm of at least one copolymerizable compound of a 6-aryl-amino-1-cyano-3H-dibenz[f,i]isoquinoline-2,7-dione or a 1,4-bis(2,6-dialkylanilino) anthraquinone in combination with at least one bis anthraquinone or bis anthrapyridone(6-aryl-amino-3H-dibenz[f,i]isquinoline-2,7-dione) compound,
- 25 wherein the compounds contain at least one polyester reactive group; and
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(iv) optionally, an ester exchange catalyst in an amount of from about 1 to about 150 ppm of an active element utilized when the acid component is derived from a diester of the dicarboxylic acid, with ppm based on the total weight of the polyester.

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23. The thermoplastic composition of claim 22 wherein the polyester comprises from about 95 to 100 mole percent of terephthalic acid, from about 58 to about 66 mole percent 1,4-cyclohexanedimethanol and from about 42 to about 34 mole percent of ethylene glycol.

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24. The thermoplastic composition of claim 22 wherein the polyester comprises 100 mole percent 1,4-cyclohexanedimethanol, from about 22 to about 30 mole percent isophthalic acid, and from about 78 to about 70 mole percent terephthalic acid.

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25. The thermoplastic composition of claim 22 wherein the titanium-containing catalyst compound is present in an amount of from about 1 to about 15 ppm elemental titanium.

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26. The thermoplastic composition of claim 22 wherein the thermoplastic composition further comprises about from 0.01 to about 0.35 weight percent of a post-polycondensation phosphorus-containing compound, based on the total weight of the blend.

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27. The thermoplastic composition of claim 26 wherein the post-polycondensation phosphorus-containing compound is distearyl pentaerythritol diphosphite.

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A molded article formed from the thermoplastic composition of claim

30 22.

29. A film or sheet formed from the thermoplastic composition of claim
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- 5 30. In a thermoplastic composition comprising a miscible blend of from
about 1 to about 99 weight percent of a polyester comprising an acid
component comprising repeat units from terephthalic acid, isophthalic acid,
and mixtures thereof and a diol component comprising repeat units from
10 about 40 to 100 mole percent 1,4-cyclohexanedimethanol and about 0 to
about 60 mole percent ethylene glycol, based on 100 mole percent acid
component and 100 mole percent diol component, and from about 99 to
about 1 weight percent of a polycarbonate of 4,4-isopropylidenediphenol,
the improvement comprising:
- 15 (1) preparing the polyester in the presence of a catalyst
consisting essentially of (i) a titanium-containing catalyst compound
in an amount of about 1 to about 15 ppm elemental titanium, (ii) a
pre-polycondensation phosphorus-containing compound in an
amount of about 45 to about 100 ppm elemental phosphorus, (iii)
20 from about 1 to about 5 ppm of at least one copolymerizable
compound of a 6-aryl amino-1-cyano-3H-dibenz[f,ij]isoquinoline-2,7-
dione or a 1,4-bis(2,6-dialkylanilino) anthraquinone in combination
with at least one bis anthraquinone or bis anthrapyridone(6-
aryl amino-3H-dibenz[f,ij]isquinoline-2,7-dione) compound, wherein
the compounds contain at least one polyester reactive group, and
25 (iv) optionally, an ester exchange catalyst in an amount of from about
10 to about 65 ppm of an active element utilized when the acid
component is derived from a diester of the dicarboxylic acid, with
ppm based on the total weight of the polyester;
- and

(2) the miscible blend comprising from about 0.05 to about 0.15 weight percent of a post-polycondensation phosphorus-containing compound selected from the group consisting of an aliphatic phosphite compound, aromatic phosphite compound or a mixture thereof, based on the total weight percent of the blend.

31. A process for preparing a blend of a polyester and a polycarbonate comprising the steps of:

- (a) producing a polyester comprising the steps of:
- (i) reacting 100 mole percent of a diacid, or ester derivative thereof, of at least one aromatic, aliphatic, or alicyclic dicarboxylic acid, wherein the aromatic portion of said aromatic dicarboxylic acid has 6-20 carbon atoms and wherein the aliphatic or alicyclic portion of said aliphatic or alicyclic dicarboxylic acid has 3-20 carbon atoms, and 100 mole percent of a diol comprising at least one aliphatic, aliphatic ether, or cycloaliphatic diol having 2-20 carbon atoms at a temperature and pressure sufficient to effect esterification for the diacid or ester exchange for the ester derivative;
- and
- (ii) polycondensing the product of step (i) at temperatures and pressures sufficient to effect polycondensation in the presence of a titanium-containing catalyst compound in an amount of from about 1 to about 30 ppm elemental titanium, with ppm based on the total weight of the polyester;
- and
- (b) compounding from about 1 to about 99 weight percent of the polyester of step (a) with from about 99 to about 1 weight percent of a polycarbonate to form a blend, with the weight percent based on the total weight percent of the blend.

32. The process of claim 31 wherein the titanium-containing compound of step (a)(ii) is present in an amount of from about 1 to about 20 ppm elemental titanium.
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33. The process of claim 31 wherein the titanium-containing compound of step (a)(ii) is present in an amount of from about 1 to about 15 ppm elemental titanium.
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34. The process of claim 31 wherein a pre-polycondensation phosphorus-containing compound is added to step (a)(ii) in an amount of from about 1 to about 150 ppm elemental phosphorus.
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35. The process of claim 31 wherein the diacid comprises from about 80 to about 100 mole percent terephthalic acid, isophthalic acid, or mixtures thereof and the diol comprises from about 40 to 100 mole percent 1,4-cyclohexanedimethanol and about 0 to about 60 mole percent ethylene glycol, based on 100 mole percent diacid and 100 mole percent diol.
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36. The process of claim 31 wherein step (b) a post-polycondensation phosphorus-containing compound is compounded with the polyester and the polycarbonate at an amount of from about 0.1 to about 0.35 weight percent based on the total weight percent of the blend.
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37. The process of claim 31 wherein step (b) a post-polycondensation phosphorus-containing compound is compounded with the polyester and the polycarbonate at an amount of about 0.05 to about 0.15 weight percent based on the total weight percent of the blend.

38. The thermoplastic composition of claim 37 wherein the post-polycondensation phosphorus-containing compound is distearyl pentaerythritol diphosphite.

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39. A process for preparing a thermoplastic composition comprising the step of compounding:

(a) from about 1 to about 99 weight percent of a polyester comprising:

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(i) an acid component comprising repeat units from about 80 to 100 mole percent terephthalic acid, isophthalic acid, and mixtures thereof, based on 100 mole percent acid component;

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(ii) a diol component comprising repeat units from about 40 to 100 mole percent 1,4-cyclohexanedimethanol and about 0 to about 60 mole percent ethylene glycol, based on 100 mole percent diol component;

and

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(iii) residues of a titanium-containing catalyst compound in an amount of from about 1 to about 20 ppm elemental titanium, a pre-polycondensation phosphorus-containing compound in an amount of from about 1 to about 100 ppm elemental phosphorus, and optionally, an ester exchange catalyst in an amount of from about 1 to about 150 ppm of an active element utilized when the acid component is derived from a diester of the dicarboxylic acid, with ppm based on the total weight of the polyester.

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and

(b) from about 99 to about 1 weight percent of a polycarbonate.

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40. The process of claim 39 wherein the polyester comprises from about 95 to 100 mole percent of terephthalic acid, from about 58 to about 66 mole percent 1,4-cyclohexanedimethanol and from about 42 to about 34 mole percent of ethylene glycol.

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41. The process of claim 39 wherein the polyester comprises 100 mole percent 1,4-cyclohexanedimethanol, from about 22 to about 30 mole percent isophthalic acid, and from about 78 to about 70 mole percent terephthalic acid.

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42. The process of claim 39 wherein the titanium-containing compound is present in an amount of from about 1 to about 15 ppm elemental titanium.

43. A polyester composition having an inherent viscosity of from about 0.6 to about 1.2 dl/g measured at 25°C in a solvent mixture consisting of 60% by weight phenol and 40% by weight tetrachloroethane and the polyester comprising:

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- (a) an acid component comprising repeat units from terephthalic acid, isophthalic acid, and mixtures thereof;
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- (b) a diol component comprising repeat units from about 40 to 100 mole percent 1,4-cyclohexanedimethanol and about 0 to about 60 mole percent ethylene glycol;

and

- (c) catalyst residues consisting essentially of (i) a titanium-containing catalyst compound in an amount of about 1 to about 15 ppm elemental titanium, (ii) a pre-polycondensation phosphorus-containing compound in an amount of about 45 to about 100 ppm elemental phosphorus, (iii) from about 1 to about 5 ppm of at least one copolymerizable compound of a 6-arylamino-1-cyano-3H-dibenz[f,ij]isoquinoline-2,7-dione or a 1,4-bis(2,6-dialkylanilino)
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anthraquinone in combination with at least one bis anthraquinone or
bis anthrapyridone(6-arylamino-3H-dibenz[f,ij]isquinoline-2,7-dione)
compound, wherein the compounds contain at least one polyester
reactive group, and (iv) optionally, an ester exchange catalyst in an
5 amount of from about 10 to about 65 ppm of an active element
utilized when the acid component is derived from a diester of the
dicarboxylic acid;

wherein the acid component is based on 100 mole percent and the
diol component is based on 100 mole percent and ppm are based on the
10 total weight of the polyester.

44. The thermoplastic composition of claim 43 wherein the polyester
comprises from about 95 to 100 mole percent of terephthalic acid, from
about 58 to about 66 mole percent 1,4-cyclohexanedimethanol and from
15 about 42 to about 34 mole percent of ethylene glycol.

45. The thermoplastic composition of claim 43 wherein the polyester
comprises 100 mole percent 1,4-cyclohexanedimethanol, from about 22 to
about 30 mole percent isophthalic acid, and from about 78 to about 70 mole
20 percent terephthalic acid.